REMARKS

The Office Action mailed January 23, 2009 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-10 and 24-32 are now pending in this application. Claims 1-10 stand rejected. Claims 11-23 were previously canceled. Claims 24-32 are newly added. No additional fee is due for newly added Claims 24-32. No new matter has been added. Newly added Claims 24-32 are included in elected Group I.

The rejection of Claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over U.K. Pat. App. GB 2 052 251 to Büttner, et al. (hereinafter referred to as "Büttner") in view of either U.S. Pat. No. 3,223,108 to Martz, Jr. (hereinafter referred to as "Martz") or U.S. Pat. No. 5,315,847 to Takeda et al. (hereinafter referred to as "Takeda") is respectfully traversed.

Initially, Applicant respectfully traverses the Examiner's assertion in the Office Action that "[a]s for the function/operation of the controller, the same is of little patentable weight in apparatus claims in that it is old and well known that the controller has many possible functions." Further, while the Examiner acknowledges that "the prior [art] fails to disclose function/operation as now claimed," the Examiner maintains his position "that, in apparatus claims, if the prior art discloses a controller and all of the claimed structure, notwithstanding function/operation of the controller, the claim subject is met since the device is clearly functioning as claimed."

Applicant respectfully disagrees with the Examiner's position and respectfully traverses the Examiner's assertion at page 3 of the Office Action that:

> [a]ll of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results . . . [a]s for the function/operation of the controller, the same is of little patentable weight in apparatus claims in that it is old and well known that the controller has many possible control scenarios . . . [a]lso with respect to claims the steps, function or method of operation of the controller is little patentable weight given that the applied prior discloses [*sic*] all of the claims structure, the device is clearly capable of functioning as claimed . . . <u>all that is required of the prior art is that the same be capable of, or having the ability of functioning</u>

> as claimed with the prior art not having the explicit [*sic*] state the claimed steps, function or method of operation . . . microcontroller/processors inherently have many possible control scenarios and that the same is clearly capable of functioning/operating as claimed with the proper programming.

(Emphasis in original.) Initially, Applicant respectfully submits that the prior art must describe or suggest the recitations of Applicant's presently pending claims rather than merely being capable of performing the claimed steps once a person of ordinary skill in the art has read Applicant's application. Such assertions that "the device is clearly capable of functioning as claimed" and "microcontroller/processors inherently have many possible control scenarios and that the same is clearly capable of functioning/operating as claimed with the proper programming" are clearly impermissible hindsight reconstruction in that none of the references of record describe or suggest a controller and/or a processor configured to perform the steps of Applicant's presently pending claims. Such teachings are only found in Applicant's application.

The United States Supreme Court has recently expressed concern regarding distortion caused by hindsight bias in an obvious analysis, and notes that factfinders should be cautious of arguments reliant upon ex post reasoning. *See, KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 82 USPQ2d at 1397. *See also, Ex parte Rinkevich*, 2007 WL 1552288 (Bd. Pat. App. & Interf. May 29, 2007). Following the Supreme Court's guidance provided in *KSR International*, with respect to impermissible hindsight, a person of ordinary skill in the art having common sense at the time of the invention would not have reasonably looked to the cited references to solve the problem associated with controlling an amount of fluid within a washing tub based on a conductivity of the fluid. Rather, such a suggestion is disclosed only in the present application. Further, if the references were combined, without looking to the Applicant's presently pending application as a roadmap, one of ordinary skill in the art at the time the invention was made would have arrived at a washing machine that controls an amount of fluid within the washing machine by using relative conductivities of supply water and fluids within the washing machine to regulate a volume and/or meter fluids supplied to the washing machine and/or to determine a number of rinse cycles, rather than arriving at Applicant's presently pending claims. As such, the combination of cited references used to arrive at the presently pending claims is impermissible, and for this reason alone, Applicant requests that the Section 103 rejection of Claims 1-10 be withdrawn.

Moreover, Applicant respectfully submits that the steps for which the claimed controller is configured to perform are not merely recitations of function but, rather, such recitations limit the structure of the controller. More specifically, a controller is structurally configured to perform certain steps and without such a structural configuration, the controller would not perform the steps. As such, the steps recited in the presently pending claims dictate the structure of the claimed controller and, thus, such recitations must be given patentable weight.

Further, Courts have held that the phrase "configured to" in hardware and/or software claims does not render a claim invalid and, as the Courts point out, "configured to" phrases are often used in claiming hardware and/or software. *Collaboration Properties Inc. v. Tandberg ASA*, 81 USPQ2d 1530, 1536-37 (N.D. Cal. 2006). The Federal Circuit has even written a hypothetical claim, based on a means-plus-function claim, as including a system "configured to perform . . ." *In re Alappat*, 31 USPQ2d 1545, 1555 (Fed. Cir. 1994). Accordingly, Applicant respectfully submits that "configured to" clauses are patentable structural limitations rather than functional limitations. Further, Applicant respectfully submits that the elements recited in the presently pending "configured to" clauses are material to the patentability of the system recited therein and are not merely statements of function.

More specifically, Applicant respectfully submits that the elements recited following the "configured to" clauses in the presently pending claims are material to the patentability of the apparatus recited therein and are not merely statements of function. For example, determining a desirable achievable rinse level; at predetermined fluid levels during a rinse cycle, measuring an average liquid conductivity; calculating an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level; comparing the calculated overall change in conductivity to the desirable achievable rinse level; and ceasing the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level lends a structure to a controller that enables the controller to control a fluid amount within a tub as recited in the "configured to" clause. As such, the recited elements have a structure that performs the limitation within the "configured to" clause and, thus, the "configured to" clause limits the structure of a recited element to a specific structure.

Accordingly, Applicant respectfully submits that the "configured to" clauses do not merely state a function of an element, but rather, limit the recited elements to a specific structure. Further, Applicant respectfully submits that none of the cited references, considered alone or in combination, describes or suggests a structure that has the ability to perform the limitations within the "configured to" clauses recited in the presently pending claims.

Moreover, the Court held that an apparatus claim needs only to be different than the prior art, not operate differently than the prior art. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). The Court has also noted that "a patent applicant is free to recite features of an apparatus either structurally or functionally." *In re Schreiber*, 44 USPQ2d 1429, 1432 (Fed. Cir. 1997). The apparatus recited in the presently pending claims not only operates differently than the system described in the cited references, but none of the references cited by the Examiner include a microprocessor programmed to determine a desirable achievable rinse level; at predetermined fluid levels during the rinse cycle, measure an average liquid conductivity; calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level; compare the calculated overall change in conductivity to the desirable achievable rinse level; and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level. Further, Applicant is free to recite features of an apparatus either structurally or functionally. As such, the presently pending claims are limited to structures, and are distinguished from the cited reference in terms of structure rather than function.

Additionally, Courts have stated that there is nothing intrinsically wrong with defining an invention by what it does rather than what it is. *In re Swinehart and Sfiligoj*, 169 USPQ 226, 228 (CCPA 1971); and *In re Echerd and Watters*, 176 USPQ 321, 322 (CCPA 1973) (citing to Swinehart). Rather, the Court in *Swinehart* held that "functional" language must meet the requirements of (1) being precise and definite enough to provide a clear-cut indication as to the scope of the invention, and (2) being limited enough to narrow the potential scope of the claim to the protection justified by the specification disclosure. Swinehart, at 228. As such, the "functional" language is not *per se* improper if the language meets the requirements of Section 112, and such features cannot simply be ignored. *Echerd*, at 322 (citing to *Swinehart*). Applicant respectfully submits that the presently pending claim

recitations satisfy the requirements of Section 112 and carry patentable weight. Accordingly, Applicant respectfully submits that the limitations of the presently pending claims distinguish the Applicant's claimed invention structurally from the cited references. For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of the presently pending claims be withdrawn.

Applicant respectfully traverses the Examiner's assertion at page 2 that "[i]t would have been obvious to one having ordinary skill in the art to modify the system of UK'251, to include the resistance network, resistor and voltage source as taught by either Martz, or Takeda, since this is considered to be a mere substitution of equivalents." In contrast to such an assertion, Applicant respectfully submits that one of ordinary skill in the art would not consider the fluid control methods in Büttner, Martz, and/or Takeda to be equivalent to the presently claimed fluid control steps programmed into a microprocessor.

"In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents." MPEP 2144.06(II) citing *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958). More specifically, each of Büttner, Martz, Takeda, and the presently pending application describes a different structure for controlling an operation of a washing machine. For example, Büttner describes a device for controlling a fluid amount within a washing machine based on one of a measured surface tension, a pH value, and an electrical conductivity of water as the water is introduced into the washing machine, Martz describes control circuitry, including a plurality of sensors and resistors, for comparatively measuring the conductivity of fluids supplied to and within a washing machine, Takeda describes a controller configured to compare and calculate conductivities of a fluid within a washing machine before and after agitation to determine a number of rinsing cycles, and the presently pending claims are directed to a resistance network and microprocessor configured to control a fluid amount within a washing machine based on change in conductivity of the fluid. Different electrical control devices would not be described in each of the cited references and the pending application if all electrical control devices were equivalent.

As such, Applicant respectfully submits that the electrical control devices described in the cited references are not equivalent to the presently claimed resistance network and microprocessor. Further, Applicant respectfully submits that one of ordinary skill in the art at

the time of the invention would not choose from all electrical control devices available when performing a particular application. Rather, one of ordinary skill in the art would choose a particular electrical control device for a particular application because the electrical control devices do not perform equivalently nor do the electrical control devices have equivalent structures. Accordingly, Applicant respectfully submits that the electrical control devices in Büttner, Martz, and Takeda are not equivalent to the resistance network and microprocessor recited in the presently pending claims and, thus, Büttner, considered alone or in combination with Martz and/or Takeda, does not describe or suggest the resistance network and microprocessor recited in the presently pending claims. For at least this reason, Applicant respectfully requests that the Section 103 rejection of Claims 1-10 be withdrawn.

Büttner describes a method of controlling a fluid amount within a washing machine based on one of a measured surface tension, a pH value, and an electrical conductivity of water as the water is introduced into the washing machine. For example, Büttner describes limiting the number of rinsing operations of a washing machine based on the surface tension of the water in the washing machine reaching a predetermined surface tension. Büttner also describes limiting the number of rinsing operations of a washing machine based on the pH value of the water in the washing machine reaching a predetermined pH value or the conductivity of the water in the washing machine reaching a predetermined conductivity. Notably, Büttner does not describe or suggest determining a desirable achievable rinse level, measuring an average liquid conductivity at predetermined fluid levels during a rinse cycle, calculating an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level, comparing the calculated overall change in conductivity to the desirable achievable rinse level, and ceasing the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level. Further, Büttner does not describe or suggest a resistance network having a sensor, a resistor, and a voltage source, wherein the sensor is positioned and configured to sense a conductivity of a fluid in the tub, and wherein the voltage source is operable to provide a sinusoidal wave input or a square wave input to the sensor to facilitate deterring mineral buildup on the sensor.

Martz describes an apparatus for controlling the characteristics of wash and rinse liquids of an automatic washing machine as a function of the relative conductivities of the liquids. The apparatus includes a sensing control (48) and a timer (49). The control circuitry

of the sensing control (48) includes a series of sensors (32, 39, and 40) and a series of resistors (i.e. 94, 95, 96, 99, and 100). A first sensor (32) measures the conductivity of the rinse water containing detergent, and a second sensor (40) measures the conductivity of the incoming water supply. A signal is developed between points (113 and 114) of a bridge circuit, and a direct current is developed through a resistor (99) at a value proportional to the difference in the conductivities measured. A second signal is developed at a point (104) due to a high resistance measured by a third sensor (39). The currents developed by the two signals flow through a resistor (100) in opposite directions such that an insufficient potential is developed to actuate a trigger device (101). As the supply or rinse water continues to fill the washing machine, the conductivity of the water in the machine changes and the resistance increases due to the conductivity measured by a sensor (32) more nearly equaling that measured by the sensor (40). Thus, the net signal developed across the resistor (100) increases, and when sufficient rinse water has been added to reduce the detergent concentration to the desired level, the trigger device (101) switches on an activating relay (84) to continue the wash cycle.

Notably, Martz does not describe or suggest a resistance network having a sensor, a resistor, and a voltage source, wherein the sensor is positioned and configured to sense a conductivity of a fluid in the tub, and wherein the voltage source is operable to provide a sinusoidal wave input or a square wave input to the sensor to facilitate deterring mineral buildup on the sensor. Moreover, Martz does not describe or suggest a microprocessor programmed to determine a desirable achievable rinse level, measure an average liquid conductivity at predetermined fluid levels during a rinse cycle, calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level, compare the calculated overall change in conductivity to the desirable achievable rinse level, and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level.

Takeda describes a washing machine that includes a washing/dehydrating tank (5), a water storage tank (7), an agitation blade (6), and a sensor (15) for detecting an electric conductivity of washing water in the washing/dehydrating tank (5) and the water storage tank (7). The sensor (15) is fixed to the bottom of the water storage tank (7). During a rinsing step, the conductivity of the rinsing water before rotation of the agitation blade (6) and the conductivity of the rinsing water after rotation of the agitation blade (6) is detected by the

sensor (15). The conductivities are compared and calculated to determine a number of rinsing cycles to achieve an appropriate rinsing operation in accordance with the detergent contained in the washing/dehydrating tank (5). A detection signal of the soiled condition of washing water from an inverter (43(B)) is in a rectified rectangular wave form, and the frequency of the rectified rectangular wave form indicates a level of soiling of the washing water.

Notably, Takeda does not describe or suggest a washing machine that includes a resistance network having a sensor, a resistor, and a voltage source, wherein the sensor is positioned and configured to sense a conductivity of a fluid in the tub, and wherein the voltage source is operable to provide a sinusoidal wave input or a square wave input to the sensor to facilitate deterring mineral buildup on the sensor. Moreover, Takeda does not describe or suggest a microcomputer that is programmed to determine a desirable achievable rinse level, measure an average liquid conductivity at predetermined fluid levels during a rinse cycle, calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level, compare the calculated overall change in conductivity to the desirable achievable rinse level, and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level.

Claim 1 recites a washing machine comprising "a tub; a resistance network comprising a sensor, a resistor, and a voltage source, said sensor positioned and configured to sense a conductivity of a fluid in said tub, said voltage source operable to provide one of a sinusoidal wave input and a square wave input to said sensor to facilitate deterring mineral buildup on said sensor; and a controller operatively coupled to said sensor and configured to control an amount of the fluid in said tub during a rinse cycle based on the conductivity of the fluid measured at an end of a wash cycle, said controller comprising a microcomputer programmed to: determine a desirable achievable rinse level; at predetermined fluid levels during the rinse cycle, measure an average liquid conductivity; calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level; compare the calculated overall change in conductivity to the desirable achievable rinse level; and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level."

None of Büttner, Martz, and Takeda, considered alone or in combination, describes or suggests a washing machine, as recited in Claim 1. More specifically, none of Büttner, Martz, and Takeda describes or suggests a washing machine that includes a resistance network having a sensor, a resistor, and a voltage source, wherein the sensor is positioned and configured to sense a conductivity of a fluid in the tub, and wherein the voltage source is operable to provide a sinusoidal wave input or a square wave input to the sensor to facilitate deterring mineral buildup on the sensor. Further, none of Büttner, Martz, and Takeda describes or suggests a controller configured to control *an amount of the fluid* in the tub during a rinse cycle based on the conductivity of the fluid measured at an end of a wash cycle, wherein the controller includes a microcomputer that is programmed to determine a desirable achievable rinse level, measure an average liquid conductivity at predetermined fluid levels during a rinse cycle, calculate an overall change in conductivity based on the measured average liquid conductivity at each predetermined fluid level, compare the calculated overall change in conductivity to the desirable achievable rinse level, and cease the rinse cycle when the overall change in conductivity exceeds an acceptable change percentage of the desirable achievable rinse level.

Rather, in contrast to the present invention, Büttner describes a method of determining *a number of rinsing operations* based on when the rinsing water reaches the conductivity of the water introduced into the washing machine, Martz describes control circuitry, including sensors and resistors, configured to rinse a detergent from a wash load using conductivities of water supplied to a washing machine and of a liquid within the washing machine, and Takeda describes a method of determining *a number of rinsing operations* based on a difference in the conductivity of the water in the washing machine before rotation of the agitation blade and after rotation of the agitation blade in the rinse cycle.

Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Büttner in view of Martz or Takeda.

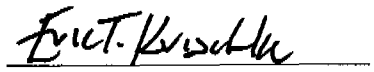
Claims 2-10 depend from independent Claim 1. When the recitations of Claims 2-10 are considered in combination with the recitations of Claim 1, Applicant submits that dependent Claims 2-10 likewise are patentable over Büttner in view of Martz or Takeda.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 1-10 be withdrawn.

Claim 24 is a newly added independent claim, which Applicant submits is patentable over the cited art. Newly added Claims 25-32 depend from newly added independent Claim 24. For at least the reasons set forth above, Applicant respectfully submits that Claims 25-32 are also patentable over the cited art.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Respectfully submitted,



Eric T. Krischke
Registration No. 42,769
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070